

# Exploration & SPACE Communications

### NASA's CIS Office: Embracing the Aerospace Community Through Strategic Engagement

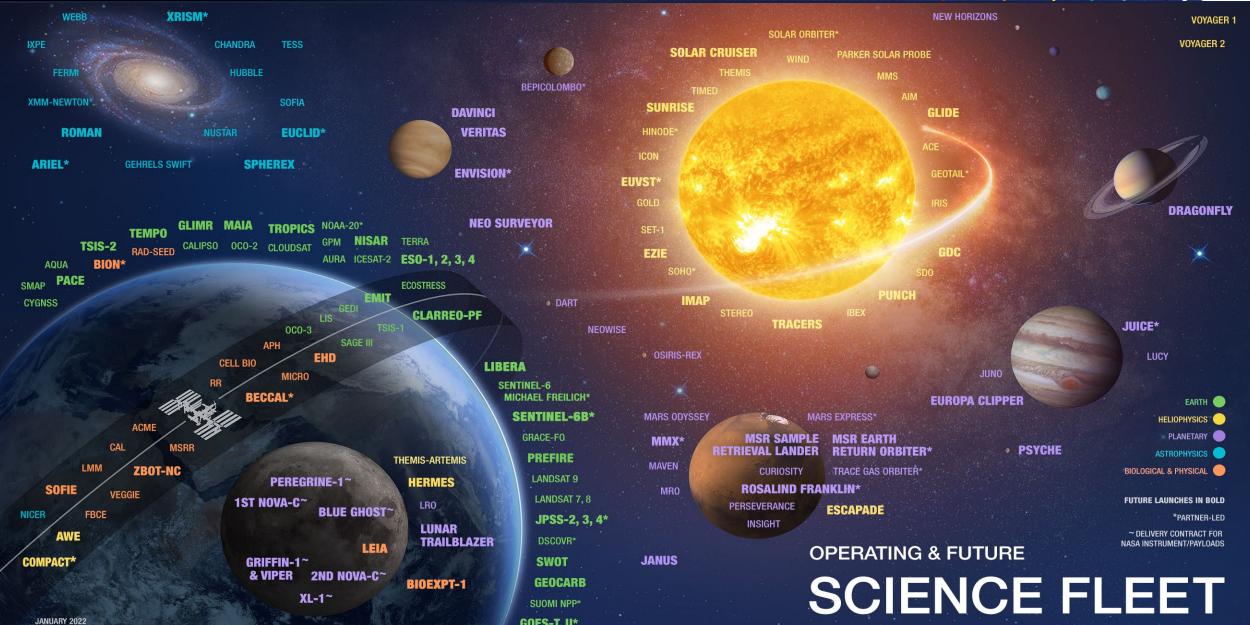
Ruma Das | CIS Deputy Chief | February 2023

More than you ever imagined...



# Exploration





# NASA's Space Communications Networks





# Network Regimes



Regime

**NEAR SPACE** 

DEEP SPACE



Range from Earth

Earth Proximity
Below 36,000 km

Lunar Proximity 70,000 km from center of Moon Earth-Moon L1/L2 61,000 km from center of Moon Cislunar 455,000 km Sun-Earth L1/L2 1.5M km

Deep Space > 2M km

Notation

Near Space is considered from 80 km to 2 million km from the Earth

> 2M km from Earth is considered Deep Space

# Our Network: The Near Space Network





# Our Goal: Partnerships & Interoperability

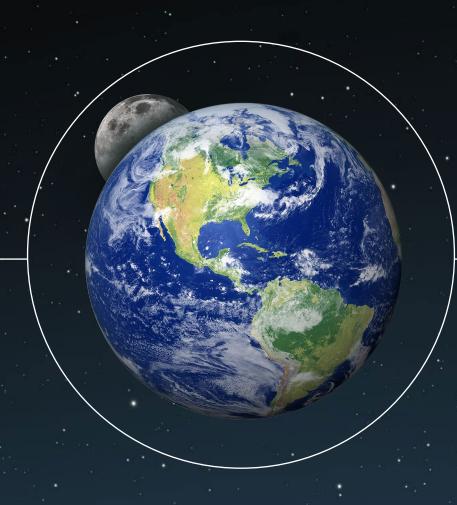


### COMMERCIAL

# PUBLIC / PRIVATE PARTNERSHIPS

Embracing the expanding aerospace industry to bring new expertise and cost savings to the government.

NASA + INDUSTY



### GOVERNMENT

# AGENCY PARTNERSHIPS

Collaborating with national and international agencies for interoperability and maximized capabilities

NASA + OGAs

# Embracing the Aerospace Community



### The Commercialization, Innovation, & Synergies Office:

- Garners new commercial providers for the Near Space Network.
- Fosters relationships with industry, government agencies, and mission teams.
- Encourages interoperability by engaging with the broader aerospace community.
- Gathers information about current and upcoming space communications technologies and capabilities.
- Hosts interactive and collaborative exchanges to increase knowledge and idea sharing in the space communications and navigation sector.







# Who Do We Engage?



#### MISSION ENGAGEMENT

Who: Mission Teams

How: Promoting NSN Services and Capabilities

Result: Onboarding Missions



#### INDUSTRY ENGAGEMENT

Who: Large and Small Aerospace Companies

How: Hosting numerous events and 1:1 meetings

Result: Incorporating Commercial Capabilities



# CIVIL & DEFENSE SPACE PARTNERSHIPS

Who: Other Government Agencies

How: Collaborative Sessions

Result: An Interoperable Space Ecosystem



# Requests for Information

# NASA

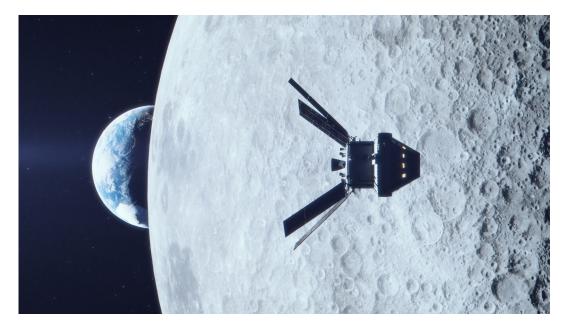
### **Track the Artemis I Mission**

**Goal**: Understand non-NASA tracking capabilities on a non-interference basis

Released: August 2022

**Status**: 20 organizations responded –

undergoing data analysis



### **Low-Cost Optical Terminals**

**Goal**: Understand industry's interest in contributing to optical ground terminals or experimenting with an existing one.

Released: January 2023

Status: Open to responses. Due March 6, 2023.



# Broad Agency Announcements (BAA)



### Near Space Communications Capabilities NextSTEP-2 BAA

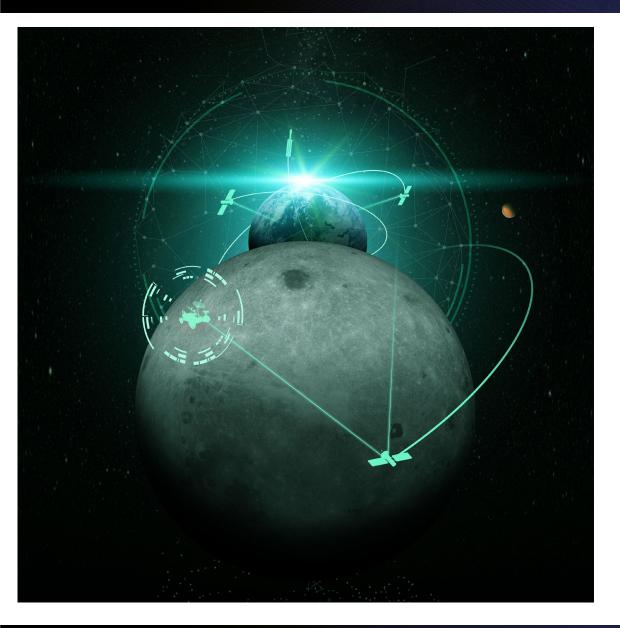
- **Goal**: to develop capability studies to explore and demonstrate communications and navigation services in support of Artemis missions to the Moon.
- Awarded under the <u>Next Space Technologies for Exploration Partnerships-2 (NextSTEP-2) Broad Agency Announcement (BAA) Appendix O.</u>
- **Status**: Two companies selected: Kongsberg Satellite Services (KSAT) USA and the SpaceLink Corporation.

Another CIS-sponsored BAA will be released in spring 2023.



## Requests for Proposal





# **Draft Request for Proposal: Near Space Network Services**

**Goal**: Solicits industry space relay and/or direct-to-Earth communications and navigation services for the Near Space Network.

**Status**: Formal Request for Proposal coming in 2023.

**Draft RFP**: <a href="https://bit.ly/3JT0hm2">https://bit.ly/3JT0hm2</a>

**Engagement**: Two Industry Days conducted in 2022. Over 300 people attended.

# Engagement Highlights – Industry





The industry engagement team hosts events to hear from and talk to the aerospace community about new capabilities and potential provider integration into the network.



#### **Topics Included:**

- RF Compatibility Testing and Future Innovation
- Integration of Optical Ground Terminals into Network Operations
- Optical Communications Standards
- Delay/Disruption Tolerant Networking (DTN)

Supported NASA's first annual Delay/Disruption Tolerant Networking (DTN) Face-to-Face.

Presented to over 100 participants from 44 companies, agencies, and teams.

Explored state-of-the-art DTN solutions from industry and government.

- Lunar Interoperability Standards
- Digital Signal Processing in the Cloud (Software Defined Radios in Cloud)
- Cislunar Position, Navigation, and Timing
- Lunar 3GPP / 5G

Hosted a OneLink keynote presentation and a Reverse Industry Day to provide broad market analysis.

Brought together over 120 industry professionals and conducted 18 one-on-one sessions with interested companies.

### Engagement Highlights – Civil and Defense





The civil and defense space partnership team fosters relationships with national and international government agencies to establish space act agreements and promote network capabilities.



# **Engaged over 300 individuals from other government agencies by hosting:**

- 7 Connection Sessions events
- 30 one-on-one briefings

### **Topics Included:**

- Wideband Networking
- Lunar Networking
- Commercial Space Partnerships
- Commercializing Communications

















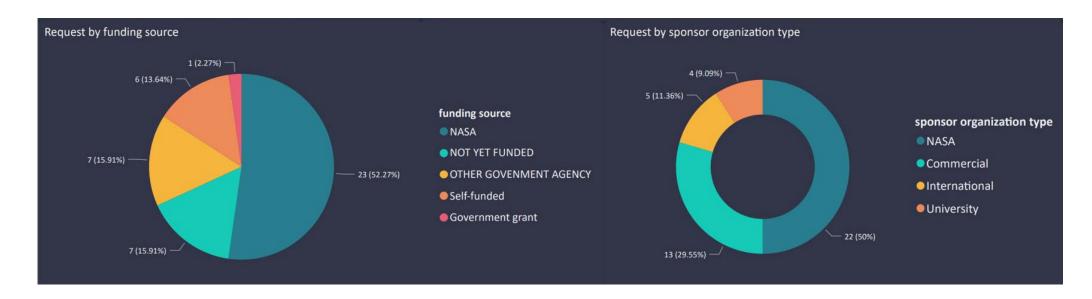
## **Engagement Highlights – Mission Teams**





The mission engagement team educates upcoming and existing missions on Near Space Network services and new technology infusion efforts that will benefit the user.





- Received 73 Service Inquiry Requests and forwarded those to the NSN Advanced Planning Team for analysis.
- Hosted 14 Mission Engagement Sessions to educate stakeholders.
- Requests were from domestic and international organizations with several different types funding sources.

### Engage with Us



### How to engage with CIS:

- Join our distribution list:
  - Get updates about RFPs, RFIs, BAAs, and all of our engagement events.
- Inquire about services through our "Service Inquiry Form"
- Reach out about specific questions or topics to our email nasa-commercialsynergies@mail.nasa.gov

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